Cardiff & Vale (C&V) UHB Corporate Medicines Management Group (c MMG)
SHARED CARE

Drug: GROWTH HORMONE (SOMATROPIN)

Protocol number: CV 27

Indication: Somatropin (Growth Hormone) is recommended for use in children with:

GROWTH HORMONE DEFICIENCY (GHD)

TURNER'S SYNDROME (TS)

POOR GROWTH ASSOCIATED WITH CHRONIC RENAL INSUFFICIENCY (CRI)

PRADER-WILLI SYNDROME (PWS)

FAILURE TO CATCH UP IN CHILDREN BORN SMALL FOR GESTATIONAL AGE (SGA)

General guidance

This protocol sets out details for the shared care of patients requiring somatropin and should be read in conjunction with the General Guidelines for Shared Care. Sharing of care requires communication between the specialist, GP and patient. The intention to share care should be explained to the patient by the doctor initiating treatment. **The doctor who prescribes the medication legally assumes responsibility for the drug and the consequences of its use.** The prescriber has a duty to keep themselves informed about the medicines they prescribe, their appropriateness, effectiveness and cost. They should also keep up to date with the relevant guidance on the use of the medicines and on the management of the patient's condition.

Background

Growth Hormone (GH) therapy involves the use of a bioengineered peptide with an aminoacid sequence identical to human pituitary growth hormone. It is administered as a subcutaneous injection, usually on a daily single injection basis. Injections may be prepared from multidose vials or by using pen injector devices. GH is used to treat deficiency of the hormone.

Indications for GH Therapy

a) Short stature and/or poor growth due to growth hormone insufficiency:
   - idiopathic isolated GH deficiency
   - congenital GH deficiency
   - acquired GH deficiency (e.g. post craniopharyngioma or cranial irradiation).

b) Turner's syndrome
c) Chronic renal insufficiency

d) Prader Willi Syndrome
e) Small for gestational age children

Diagnostic Criteria for GH Insufficiency

The following features indicate GH insufficiency:

a) Short stature that is inappropriate for parental heights.

b) Sub normal growth rate (usually a height velocity below the 25th centile usually equates to less than 5 cm per year in a pre pubertal child).

c) Growth delay confirmed by delayed skeletal maturation.

d) Clinical and/or imaging evidence of a structural disorder of the hypothalamo pituitary axis.

e) Exclusion of other genetic, environmental and systemic causes of growth failure.

f) Biochemical evidence of GH insufficiency.

Diagnostic Criteria for use of GH in Turner's Syndrome

Chromosome analysis consistent with Turner's syndrome.

Sub normal growth rate (usually a height velocity below the 25th centile).

Short stature that is inappropriate for parental heights.

Biochemical testing of GH is not required.

Diagnostic Criteria for use of GH in CRI

Children with CRI often have severe growth retardation which may persist after transplantation. It has been shown that supraphysiological levels of growth hormone increase height velocity significantly in the vast majority of such patients. The aim is to promote growth when the height is less than the 3rd centile and/or height velocity is less than 25th centile over at least one year and all other factors which might impede growth have been optimised (e.g. nutrition, metabolic bone disease, electrolytes and acidosis and steroid doses reduced to a minimum).

Diagnostic Criteria for use of GH in Prader-Willi Syndrome

Chromosome analysis consistent with PWS.

Sub normal growth rate (usually a height velocity below the 25th centile).

Abnormal body composition.

Diagnostic Criteria for use of GH in SGA children

Birthweight and/or birth length <-2.5 Standard deviations (SD) below the mean (~0.4th centile).

Failure to catch up by 4 years of age (height <-2.5 SD (~0.4th centile)).

Height velocity <0 SD (50th centile for growth velocity).

Predicted final height <-1.0SD from mid parental height (outside parental target height range).

Responsibilities

A. Consultant responsibilities

1. When treatment is **initiated** send Shared Care request form with Shared Care Protocol to GP
2. Initiate therapy following full discussion with the patient of benefits and risks.
3. The first two weeks supply of GH will be prescribed by the Consultant from the Hospital Pharmacy.
4. Baseline and continued monitoring of clinical and biochemical parameters.
5. In Prader-Willi Syndrome patients ensure adequate assessment of upper airway including sleep studies prior to therapy.
6. Respond to any request from GP to review the patient due to adverse effects of therapy.
7. When a GP positive response to SC has been received and patient has been stabilised send a letter to GP "handing over" the Shared Care of the patient to the GP.
8. Advise the GP on continuing or stopping GH therapy following medical review of the patient and associated drug therapy.
9. Notify GP if patient is failing to attend for appropriate monitoring and advise GP on appropriate action.

B. General practitioner responsibilities

1. Within one week of receipt return the completed Shared Care request form to indicate whether or not willing to undertake Shared Care.
2. Prescribe Growth Hormone as part of the shared care agreement.
3. Monitor the general health of the patient
4. Report adverse effects of therapy to the Consultant and the Medicines and Health Care products Regulatory Agency (MHRA).
5. To act on advice provided by the Consultant if patient does not attend for appropriate monitoring.

C. Patient (and/or carer) responsibilities

1. Consent to treatment with somatropin.
2. Attend regular appointments with specialist centre and GP.
3. Report any side effects to the specialist or GP whilst receiving somatropin.

Dosage Regimen

a) GH deficiency: 0.025-0.035mg/kg/day or 5-7mg/m^2/week divided into 6-7 daily doses. Dosage is guided by growth response and pubertal progress.

b) Turner's Syndrome & CRI: 0.045-0.05mg/kg/day or 10mg/m^2 per week divided into 6-7 daily doses. Dosage is guided by growth response.

c) PWS & SGA: 0.035mg/kg/day or 7mg/m^2/week divided into 6-7 daily doses. Dosage is guided by growth response and pubertal progress.

Duration of GH Therapy

Determined by:

a) Age of diagnosis of GH insufficiency.

b) Age at which epiphysial fusion and final adult height is achieved (GH is usually discontinued when growth rate is less than 2 cm per year).

c) Response to GH treatment. Height improvement in severe GH deficiency is impressive and further confirms the diagnosis. In less severe GH deficiency which overlaps with normal variant short stature, the response may be more equivocal and an increase in height velocity of at least 2 cm per year is usually expected as adequate evidence of a cost benefit of continued therapy (NICE 2002).

Monitoring

Formal assessments of growth (and puberty if appropriate) will be made 4-6 monthly at the Paediatric Endocrinology Clinic. A bone age and and other relevant biochemical investigation (e.g. thyroid function) will be undertaken where necessary by the Paediatric Endocrinologist.

Adverse effects

Safety record is excellent. Antibody formation can occur but does not seem to be of physiological relevance. Local injection site reactions are unusual and more likely to be due to unnecessary use of a spirit based skin cleanser. GH therapy may also alter glucose metabolism though the risk of Diabetes Mellitus does not seem to be significantly increased. Concern has been raised about the possible increased incidence of slipped femoral epiphysis during period of rapid growth. Rarely GH treatment may be associated with benign raised intracranial pressure. There has been concern about a possible increased incidence of leukaemia and other tumours with GH therapy. However, there appears to be no evidence to support this concern.. A significant number of children selected to receive GH are at risk of primary tumour recurrence or a secondary tumour because of the previous therapy they have received and extensive surveys have not suggested any additional increased risk with GH therapy.

Interactions

Patients with diabetes mellitus may require adjustments of their insulin. GH therapy may unmask other pituitary hormone deficiencies.

Special recommendations The brand of Growth Hormone prescribed by the Endocrinologist will be advised to the GP. Needles and a range of pen injector devices will be distributed via the specialist clinic but alternative local suppliers can be organised in liaison with the clinic and/or supplier. Storage containers and safety bins are also provided.

Date of review April 2020